ABSTRACT

PRE-SERVICE TEACHERS’ RESPONSES TO STUDENT BEHAVIOR IN A MIXED REALITY ENVIRONMENT

by Jillian Black

This study examined whether student gender and the type of student misbehavior had an effect on the classroom management techniques of pre-service teachers. Participants were pre-service teachers who interacted with avatar students controlled by an actor in a mixed-reality environment. Avatar students’ behaviors were systematically organized into categories and recorded along with their gender. Pre-service teachers’ responses were organized into four categories: coercion, retreatism, normative, and remunerative. Pre-service teachers’ use of proximity and tone of voice were also recorded. Data was analyzed using chi-square and ANOVA tests. Significant differences in pre-service teacher responses were found for type of avatar student misbehavior but not avatar student gender. Results and implications for future research and practice are discussed.
PRE-SERVICE TEACHER’S RESPONSES TO STUDENT BEHAVIOR IN A MIXED-REALITY ENVIRONMENT

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Pre-Service Teachers’ Responses to Student Behavior in a Mixed-Reality Environment

Literature Review

Classroom Management

In order for effective instruction to take place, teachers must be able to maintain order in their classrooms. Teachers who prevent student misbehavior from occurring and who can redirect misbehavior quickly will spend less time off-task and be able to devote more time to quality instruction. Classroom management is often one of the greatest concerns for pre-service teachers before they enter the field. They often fear that they will not be able to control student behavior and that students will not accept them as authority figures (Bromfield, 2006). This concern extends beyond pre-service teachers, however, also applying to practicing teachers. Difficulty controlling and managing the classroom is the most common reason for a teacher-initiated transfer request and for teacher burnout (Gonzales, Brown, & Slate, 2008; Ozdemir, 2007). Managing a classroom full of different personalities is a skill that cannot be mastered without practice, and teachers’ self-efficacy tends to improve with years of experience. Typically, researchers have found that pre-service teachers feel less confident in their classroom management abilities than teachers who had experience in the field (Giallo & Little, 2003). However, even studies that found no difference in pre-service and in-service teachers’ confidence levels overall in classroom management reported that pre-service teachers may have naïve beliefs about specific techniques to be used (Rosas & West, 2009). Pre-service teachers often do not yet have an understanding of what techniques they can employ in order to get an unruly student back on task.

Reupert and Woodcock (2010) looked specifically at the classroom management techniques that pre-service teachers reported they were most likely to use, most confident in using, and found most effective. Pre-service teachers were most likely to use initial corrective strategies, such as proximity and saying the student’s name as a warning, and least likely to use later corrective strategies, such as referring the student to another school professional. Pre-service teachers also felt more confident and found greater success using initial corrective and prevention strategies than they did using later corrective strategies or manipulating the rewards system. Although pre-service teachers reported that their use of preventative and early corrective strategies was effective, they also indicated that they were not confident using later corrective
strategies. These findings indicate that pre-service teachers may not be well-prepared to handle situations in which students’ behaviors escalate or become violent.

Although teachers employ different methods to control student behaviors and ensure that their classroom environment is conducive for learning, techniques can generally be grouped into similar categories. In a 2008 teacher survey, Little and Akin-Little identified four types of classroom management techniques: classroom rules, enhancing the classroom environment, reinforcement strategies, and reductive procedures. In addition to these strategies, Hart (2010) identified two other techniques: the importance of maintaining positive teacher-student relationships as a way to reduce problem behaviors and having high behavioral expectations for students. In his survey Hart found that educational psychologists perceive the most effective classroom management technique to be positively reinforcing appropriate behavior, followed by responding to inappropriate behavior and setting classroom rules respectively.

For the purpose of this study we chose to use the category management strategies defined by Schlechty in 1976. Schlechty’s categories were chosen because they are succinct and encompass all of the types of pre-service teacher responses that were observed in the study. Schlechty outlined four different ways in which teachers could respond to student misbehavior. The normative strategy is used when the teacher asks the student to change his or her behavior and comply with directions or classroom rules. Teachers using a remunerative strategy refer to or manipulate the reward system in order to motivate the student to change his or her behavior. A coercion strategy indicates that the teacher uses force or threats to regain control over the misbehaving student or the classroom. Finally, retreatism is when the teacher ignores the behavior. Specifically, Schlechty defines retreatism as a failure to address problem behaviors rather than the strategy of purposefully ignoring misbehavior. For the purpose of this study we will look at retreatism as both a failure to address the problem as well as a purposeful strategy. Schlechty’s original definition of retreatism was amended for this study because without asking additional follow-up questions it would impossible to determine whether participants were ignoring misbehaviors purposefully or failing to respond due to lack of confidence or knowledge of how handle the situation.

TeachME Lab Technology in Teacher Education

Technology in teacher education may change the way that pre-service teachers practice their skills before entering the field. The use of virtual technology has allowed an
interdisciplinary team at the University of Central Florida to develop virtual classrooms in which pre-service teachers can interact with avatar students (Dieker, Hynes, Hughes, & Smith, 2008). The TeachME (Teaching in Mixed-Reality Environments) lab was developed to provide novice teachers with a simulated and safe environment in which to practice their skills. One of the main reasons for its development was to provide “novice and practicing teachers the opportunity to ‘manage’ classroom behavior where failure does not influence the learning of real students” (Dieker et al., 2008, p. 6). In some regards, this is an ideal way to practice skills because it is not necessary to protect an avatar student. Pre-service teachers using this technology do not need to worry about the possibility of psychologically harming real students because they are interacting with an adult actor who is portraying five different student avatars. In this type of mixed-reality environment it is possible for practicing teachers to have the option to start over without the “students” remembering the initial interaction (Andreasen & Haciomerglu, 2009). The pre-service teacher stands in front of a projection screen in which he or she can see the classroom of five avatar students. He or she can interact with the avatar students, each of which has assumed a different personality. The student avatar’s personalities were developed using the American Academy of Child and Adolescent Psychiatry’s description of adolescent development as well as the theories and framework of other researchers and earlier theorist such as Piaget and Erikson (Andreasen & Haciomerglu, 2009). Because the avatars are being directly controlled by an actor, the actor can decide how to react or can follow a script that tells him or her whether to escalate or de-escalate the situation. The actors are professionals who are training in acting, improvisation, and human psychology (Dieker et al., 2008). Teacher educators may design a scenario and session objectives in order to have the pre-service teachers practice certain skills. The pre-service teacher can step on specific markers on the ground that allow him or her to zoom in on a particular student or can step back and address the classroom as a whole. Thus, pre-service teachers get a real sense of what it is like to manage a classroom full of students with different personalities.

Andreasen and Haciomerglu (2009) examined the TeachME lab’s educational value by having pre-service secondary mathematics teachers deliver lessons to the virtual students. They found that the technology had practical implications for allowing teachers additional ways to practice and enhance their skills. Though the pre-service teachers were able to practice delivering lesson plans, the more unique benefit was that it allowed for practicing classroom
management with a diverse and challenge group of students without repercussions (Andreasen & Haciomerglu, 2009).

The TeachME lab not only benefits teacher education, but has the potential to inform research as well. In a traditional classroom it is difficult or impossible to manipulate certain variables such as student behavior. Although this technology allows researchers to have control and consistency in the classroom environment (Dieker et al., 2008), it should be noted that it is a contrived setting and may not be an entirely accurate indication of how pre-service teachers would naturally act in the classroom.

**Gender Differences**

It has been well documented that male students receive more feedback and attention in the classroom than do female students (Brophy, 1985; Kelly, 1988). There is evidence that this discrepancy exists regardless of teacher gender, grade, the subject of study, or the student’s ethnicity and socioeconomic status (Kelly, 1988). Boys are more likely to receive both positive and negative teacher responses. These findings are confounded by evidence that male students are also more likely to misbehave in the classroom or to engage in behaviors that ensure that they receive this attention (French & French, 1984). There is some evidence that although boys tend to dominate classroom interactions, teachers’ responses and interactions with boys are more focused on management than on academics (Younger, Warrington, Williams, 1999). Additionally, Younger et al. (1999) suggest that teachers have a lower tolerance for boys’ misbehavior than for girls.

Together, these findings have led many researchers over the years to conclude that schools may favor girls. In 1985, Brophy claimed that characteristics of girls’ gender roles may lend themselves better to the prototype of the ideal student than do boys’ characteristics. Girls tend to be more compliant, focused, and eager to please teachers and peers than their male counterparts (Brophy, 1985). Since Brophy’s assertion, other studies have substantiated his claims. For example, Backe-Hansen and Ogden (1996) found that in primary classrooms traditionally female characteristics were viewed as more ideal and valuable than traditionally male characteristics. Teachers were more likely to view their female students as more competent and were more likely to use female students’ behaviors as the standard to which both male and female students should comply. These findings suggest that teachers may base their behavioral expectations off of what they observe in their female students, a standard that may not reflect
typical male behavior or be as easily attainable for male students. Backe-Hansen and Ogden (1996) assert that instead of interpreting boys’ behavior as normal and typical for their gender, teachers may label them as pathological when using girls’ typical behavior as the comparative norm.

Male students outnumber female students in school discipline, although student race often confounds these findings. Some studies indicate that gender is a more important predictor than race and that male students, regardless of race, are more frequently and severely disciplined (Skiba, Michael, Nardo, & Peterson, 2002). Other studies, however, have found that African American females are more likely to receive school discipline than White males, indicating that race may be the stronger predictor (Raffaele Mendez & Knoff, 2003).

Despite the lack of consensus on the unique contributions of gender and race to school discipline, it is safe to say that even when controlling for race, male students receive a disproportionate amount of exclusionary school discipline than their female counterparts (Wallace, Goodkind, Wallace, & Bachman, 2008). Boys are more likely to be expelled and suspended, which is linked with various negative long term outcomes such as dropping out of school and becoming involved in the juvenile justice system (Skiba et al., 2003). The connection between students who are suspended or expelled later becoming involved in crime has been called the school-to-prison-pipeline. Male students are more likely than females to behave in ways that warrant harsh punishment (Skiba et al., 2002). However, in some ways teachers’ reactions to students’ behaviors may contribute to and perpetuate this imbalance.

In a 2004 study by Erden and Wolfgang, pre-kindergarten through first grade teachers were given four vignettes describing an incident of student misbehavior and were asked to report how they would address the student. Half of the participants were told that the student was male and half were told that the student was female. Teachers responding to the male student used the Rules and Consequences philosophy in which teachers have greater power in trying to control the student’s behavior by enforcing punishment for misbehavior and rewards for good behavior. Teachers responded to the female student with a Confronting-Contracting philosophy. Teachers employing this philosophy used less control and gave the student more opportunity to correct her behavior instead of moving directly towards consequences. The student’s misbehavior is confronted but the student chooses how she will change her behavior and takes on the responsibility of abiding by the behavioral contract. Thus, this study provides evidence that
teachers may abide by different philosophies of discipline depending on the gender of the student. Erden and Wolfgang (2004) suggest that teachers may prefer the Confronting-Contracting philosophy for girls because it involves negotiating with the student. Teachers may feel that because girls are more verbal and willing to please they may be more likely to adhere to the behavioral contract than boys.

There is other evidence that student gender may interact with teacher gender and experience to effect teachers’ perceptions of student behavior. Green, Shriberg, and Farber (2008) examined pre-service and practicing teachers’ perceptions of the severity of student behaviors in four different vignettes. The researchers found some differences in teachers’ perceptions based on the gender of teacher, gender of the student, and the teachers’ level of experience (pre-service vs. practicing). Female teachers rated three of the four vignettes (difficulty developing peer relationships; slow to learn new skills; inability to function normally) as more severe than their male counterparts. Pre-service teachers rated a student having difficulty with a peer relationship as more severe for a male student than a female student; however, practicing teachers rated both genders equally. Additionally, female and male pre-service teachers rated that a student struggling to learn a new skill was equally severe for male and female students. Thus, the interaction of student and teacher gender as well as the level of teacher experience appears to play a complex role in teachers’ perceptions of student behavior.

Though some studies indicate a gender bias in teachers’ responses to students, other studies have not found this same bias. Noltemeyer, Kunesh, Hostutler, Frato, and Sarr-Kerman (2012) similarly examined teachers’ responses to student behavior using vignettes. Teachers read one of four scenarios which were altered to imply a different race and gender combination for each vignette. After reading the vignette, teachers completed a scale indicating how they perceived the student’s behavior and how they would address it. The researchers did not find a significant relationship between teachers’ responses and the race or gender of the students. These findings imply that teachers’ responses to students’ behavior may be too complex to be predicted only by implied race or gender alone, without other contextual information. Alternatively, teachers participating in such studies may be aware of racial and gender bias and give socially appropriate responses in contrived settings.
The Present Study

Although there have been studies on the techniques and approaches teachers use to manage misbehavior, many of them are outdated and additional research is needed to replicate and extend these findings in a sample of current pre-service teachers. In addition, previous studies have relied on data collected from teachers’ responses to hypothetical situations rather than observation of teachers’ actual behaviors. Also, though many studies have examined how student race and how gender in relation to race impacts school discipline, there are few studies that consider only gender and even fewer that have investigated how teachers’ classroom management techniques differ based on their preconceived notions about gender. Teachers’ beliefs about gender-normative behavior, as well as their perceptions of the severity of behaviors, may influence how they respond to student misbehavior.

The objective of this study was to use mixed-reality technology to improve the authenticity of extant research by investigating whether pre-service teachers respond to student avatars engaging in the same misbehavior differently based on the gender of the student avatar, and whether pre-service teachers’ behavior management strategies differ based on the behaviors exhibited. Specifically, the research questions were: (1) Are there significant differences in pre-service teacher response to misbehavior, management style, and duration of incident based on student avatar gender, when considering the same types of misbehavior, and (2) are there significant differences in pre-service teacher response to misbehavior, based on the type of behavioral infraction? It was hypothesized that pre-service teachers would respond more negatively and punitively to males’ misbehavior than females’. More specifically, the researchers anticipated that pre-service teachers would exhibit more controlling responses when interacting with male student avatars and would likely try to end the incident of misbehavior quickly. The researchers expected that pre-service teachers would be more likely to reason with and explain their reactions to female student avatars. Thus, interactions with female student avatars would be of a longer duration than that of male student avatars. Also, it was hypothesized that pre-service teachers would be more likely to use proximity and retreatism when controlling more serious behaviors such as calling out and non-compliance and more likely to use coercion when addressing less serious behaviors such as off-task motor behaviors and inappropriate peer-to-peer interaction. The researchers anticipated that because the pre-service teachers had less experience in the field they would feel less confident in addressing more
serious behaviors and would ignore these or use non-verbal means to control them. Additionally, inexperienced teachers would likely feel more confident in quickly and punitively responding to less serious infractions.

**Method**

**Setting and Participants**

Participants were undergraduate students enrolled in a public university in the Midwest. A total of 31 students (46% male, 54% female) participated. These students were all pre-service middle childhood or adolescent education majors. Sessions took place in the TeachLivE lab (previously referred to as the TeachME lab) located on campus.

**Materials**

**Video recording.** Two TeachLivE lab sessions were recorded on DVDs by the researcher over the course of the Spring 2012 semester. The researcher stored these DVDs in a locked file cabinet. After one year the DVDs will be discarded and there will be no way to identify participants in the study.

**Coding Form.** The behaviors of the avatar student and pre-service teachers were coded using a form created for this purpose (see Appendix A). The avatar students’ behavior was coded based on the type of confrontation presented (i.e., non-compliance, calling out or talking out of turn, off-task commentary, inappropriate peer-to-peer conversation or interaction and off-task motor behavior). The race and gender of the avatar student was also recorded. The pre-service teachers’ response to the student behavior was coded based on whether the pre-service teacher asked the avatar student to change his or her behavior, referred to the reward system, made threats, or ignored the behavior. The pre-service teachers’ tone of voice was rated using a 5-point scale from negative to positive. A score of “1” was the most negative score, “3” was considered neutral, and “5” was the most positive. Other studies have used a similar 5-point scale in order to rate participants’ tone of voice (Trachtenberg & Viken, 1994). Pre-service teachers’ use of proximity, defined as the teacher stepping on a student avatar’s space on the floor causing the camera to zoom in on that particular student avatar, was also recorded. Finally, the duration from initial confrontation by the student avatar to the resolution of the situation was recorded.
Research Design and Data Analysis

The study design is causal-comparative. The researchers were interested in looking at how a naturally occurring independent variable (avatar student gender) affected the dependent variable (pre-service teachers’ responses). Because the study is not truly experimental the researchers’ goal was to observe pre-service teachers’ responses in a more naturalistic setting.

The data were analyzed using descriptive statistics. In addition, a chi-square test was used to see if there were gender differences in the pre-service teacher responses and management style. A chi-square test is used to determine if frequency data differs between two or more categories, or for the purpose of this study, if pre-service teachers’ responses and management styles differed between male and female avatar students or between different types of behavioral infractions. Finally, an ANOVA was used to examine whether there were gender differences in the duration of the incident from onset to resolution and in the pre-service teacher’s tone of voice. Unlike the pre-service teacher response and management style, the duration of the incident and tone of voice are continuous variables. Consequently, an ANOVA – which is used with continuous dependent variables – was used.

Procedure

Prior to the initiation of the study, participants signed a videotape consent form as part of course requirements and normal instructional practices. A signed consent form for releasing these videos and agreeing to study participation was obtained from each participant prior to the researchers viewing the videos (see Appendix B). One of the researchers visited each class to explain the study, answer questions, and obtained written consent (course instructors left the room during these events) for those who wished to participate. Participants were informed that their participation was completely voluntary, that they may withdraw at any time, and that their participation had no effect on their grade. Given the unique nature of the research, it was believed that making participants aware of the true purpose of the study (i.e., to look at how responding differs based on gender) would actually contribute to the development of unpleasant feelings of being tricked or duped. In contrast, without debriefing, it was assumed that there were no risks encountered that were greater than everyday life for participants. Therefore, the researchers included a statement on the informed consent form giving participants the opportunity to learn more about the purpose of the study and results by contacting the faculty advisor (the primary investigator) (See Appendix B). No participants contacted the researchers
and the debriefing process was never used. This study was reviewed and approved by the university’s Institutional Review Board.

After providing consent, each participant engaged in two to five TeachLivE lab sessions over the course of the semester, as part of the course requirements for two undergraduate education courses. Each session lasted approximately 5 to 15 minutes and was structured to allow pre-service teachers to practice their classroom management techniques. One session from each class was videotaped by the researchers and only the videos of students who had provided written consent for this study were viewed by the researchers. The researchers coded the behaviors of the avatar students and pre-service teachers. The avatar students’ behavior was coded based on the type of confrontation presented (non-compliance, calling out or talking out of turn, off-task commentary, inappropriate peer–to–peer conversation or interaction and off-task motor behavior). Student misbehavior is defined as a violation of the rules set forth in the TeachLivE session script, or a failure to correct behavior when confronted by the pre-service teacher. As previously described, avatar students’ misbehaviors and pre-service teachers’ responses were coded categorically using a form for each session, as well as, information on demographics, duration, and proximity. All coded data were entered into SPSS.

In order to check for inter-rater reliability, a second graduate student also participated in the coding of the behaviors for eight of the total 31 sessions recorded. The primary rater explained to the secondary rater the criteria used to determine each coding category. The same avatar student behavior could not be coded more than once. For example, the student could not be both calling out and engaging in inappropriate peer-to-peer interaction at the same time, however, these behaviors could occur consecutively within the same incident. Both raters watched three videos together and the primary rater demonstrated how she would score each of the videos. The secondary rater scored the demonstration videos for practice, and to receive feedback, but these were not included in inter-rater reliability calculations. After this training process, the primary and secondary rater watched the videos and coded them independently. Of these eight videos there was acceptable agreement (78%) on the number of behavioral incidences between the pre-service teacher and the avatar student that were coded. Interrater reliability between categories was compared between two videos that were reported to have the same number of incidences. These two videos were the only videos that could be compared across categories because the researchers could be certain that the incidences that the two coders saw
were the same incidences. There were a total of seven incidences observed by both the primary investigator and the secondary coder for these two videos. The coders reported 89% agreement for identifying the race and gender of the avatar student, the avatar student’s behavior, and the pre-service teacher’s gender, use of proximity, and management style. Interrater reliability for the duration of each incident and the pre-service teacher’s tone of voice was assessed using Pearson correlation coefficients. The Pearson correlation coefficients were used for duration and tone of voice because they are continuous variables. Both measures of duration, \( r(7) = .908, p < .005 \), and tone of voice, \( r(7) = .881, p < .005 \), were found to have a strong correlation.

**Results**

**Gender and Teacher Response**

When coding videos it was found that male and female avatar students were engaging in different types of misbehaviors. For example, off-task motor behaviors made up 29.8% of all male misbehaviors but 0% of all female misbehaviors (See Table 1). Consequently, gender and pre-service teacher response were compared only for the behaviors where the difference between male and female engagement was not statically significant. These two behaviors were non-compliance, \( X^2(1) = .460, p = .269 \), and inappropriate peer-to-peer interaction, \( X^2(1) = .519, p = .069 \). For non-compliance, pre-service teachers’ use of proximity, \( X^2(1) = .652, p = .459 \), normative management, \( X^2(1) = .173, p = .855 \), remunerative management, \( X^2(1) = .083, p = .926 \), coercive management, \( X^2(1) = .909, p = .487 \), and retreatism, \( X^2(1) = .156, p = .613 \), did not differ based on the gender of the avatar student. Likewise, for inappropriate peer-to-peer interaction, pre-service teachers’ use of proximity, \( X^2(1) = 2.852, p = .124 \), normative management, \( X^2(1) = 2.769, p = .154 \), remunerative management, \( X^2(1) = .104, p = .907 \), coercive management, \( X^2(1) = 1.574, p = .269 \), and retreatism, \( X^2(1) = .110, p = .546 \), did not differ based on the gender of the avatar student with whom they were interacting. Furthermore, no significant results emerged for tone of voice, \( F(24, 25) = .204, p = .655 \), \( F(52, 53) = .228, p = .355 \), or duration of the incident, \( F(25, 26) = .957, p = .337 \), \( F(52, 53) = .869, p = .355 \), for either non-compliance or inappropriate peer-to-peer interaction, respectively. Collectively, these findings reveal no significant differences in pre-service teacher response based on the gender of the avatar student.
Table 1.

Frequency of female vs. male engagement in misbehavior by category

<table>
<thead>
<tr>
<th>Avatar Student Behaviors</th>
<th>Number of Incidences</th>
<th>Total Incidences</th>
<th>Percentage of Incidences of Misbehavior Out of Total Incidences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
<td>13</td>
<td>15.4</td>
</tr>
<tr>
<td>Male</td>
<td>25</td>
<td>116</td>
<td>21.6</td>
</tr>
<tr>
<td>Calling out</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>13</td>
<td>84.6</td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>116</td>
<td>25.9</td>
</tr>
<tr>
<td>Off-task commentary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>13</td>
<td>38.5</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>116</td>
<td>7.8</td>
</tr>
<tr>
<td>Off-task motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>116</td>
<td>29.8</td>
</tr>
<tr>
<td>Peer-to-Peer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>13</td>
<td>38.5</td>
</tr>
<tr>
<td>Male</td>
<td>49</td>
<td>116</td>
<td>42.2</td>
</tr>
</tbody>
</table>

Type of Infraction and Teacher Response

More fruitful findings emerged when looking at pre-service teachers’ responses to avatar students based only on the type of infraction. Pre-service teachers were significantly more likely to ignore avatar students engaging in non-compliance, $F(1)=23.575, p=.000$, and avatar students who were calling out, $F(1)=4.969, p=.023$, during the session. Pre-service teachers were less likely to ignore avatar students who were engaging in off-task motor behaviors, such as clicking a pen, $F(1)=16.300, p=.000$. Additionally, pre-service teachers were more likely to control behaviors using proximity when the avatar student was engaged in an activity other than calling out, $F(1)=6.960, p=.008$. Proximity was more likely to be used as a method of control when avatar students were engaged in inappropriate peer-to-peer interaction, $F(1)=3.536, p=.004$. 

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Discussion

The purpose of this study was to examine whether pre-service teachers responded differently based on the gender of the student or the type of misbehavior that the student was engaged in. Despite the value of the TeachLivE for instructional purposes, the nature of this environment made the specific research questions of this study difficult to examine. The TeachLivE avatar students engaged in the same behaviors across sessions based on their characters. For example, one character engaged in off-task motor behavior during every session but did not engage in any other misbehaviors. Due to this sometimes disproportionate frequency of behaviors, only behaviors where there was not a significant difference between the number of males and females engaging in the behavior were statistically analyzed. Of the behaviors observed, only non-compliance and inappropriate peer-to-peer interaction were found to not have a statistically significant difference between the frequency of engagement between genders. However, contrary to our hypothesis, the analysis of these two misbehaviors did not reveal significant differences in pre-service teacher responses based on gender. These findings are consistent with Noltemeyer et al. (2012) who reported that teachers’ responses did not differ significantly based on the gender of the student. The present study further contributes to the current research suggesting that gender alone may not be enough to predict interactions between students and teachers. Contrary to findings reported by Erden and Wolfgang (2004), teachers in this study did not respond more harshly and punitively to male students than female students. This may be because pre-service teachers are taught to eliminate bias based on the gender of the student and instead respond according to the nature of the infraction. Another possible explanation may be that the pre-service teachers modified their reactions to be more equitable because they knew they were being watched and evaluated by their course instructor.

When examining pre-service teachers’ responses to avatar students based on behavior, some patterns did emerge. In partial support of the hypothesis, the pre-service teachers were more likely to ignore avatar students who were displaying non-compliant or calling out behavior. This response may be a deliberate strategy that the pre-service teachers used to address the behavior, rather than merely a failure to react. Weinstein (2003) suggests that deliberately ignoring behavior may be the best strategy for brief misbehaviors if the teacher feels that this is an uncommon occurrence and addressing the misbehavior would actually be more disruptive. This is a possible explanation for why pre-service teachers may have ignored calling out
behavior. Pre-service teachers may have ignored non-compliance in order to not be drawn into an argument with an avatar student. Tileston (as cited in Shellard, Protheroe, & Turner, 2005) recommends that teachers practice letting students’ batting comments go ignored so as not to engage in a verbal battle. Alternatively, as non-compliance and calling out were two of the most extreme behaviors that avatar students in the TeachLivE session engaged in, this response may reflect pre-service teachers’ lack of confidence in addressing more serious infractions (Reupert & Woodcock, 2010).

In the present study, pre-service teachers were also less likely to ignore off-task motor behavior. In each of the sessions, off-task motor behavior manifested in the form of an avatar student clicking or drumming on the desk with his pen. It may be that teachers felt more confident in their ability to control this type of behavior due to its less confrontational nature. However, contrary to the hypothesis, pre-service teachers were not more likely to use a coercive strategy when addressing off-task motor behavior or inappropriate peer-to-peer interaction. The pre-service teachers were aware that coercive strategies existed such as sending the student avatar to the principal or writing the student avatar’s name on the board; therefore, it was not their lack of awareness of this option that explained these results. Additionally, pre-service teachers were more likely to use proximity when managing inappropriate peer-to-peer interaction. This strategy may have been deemed most appropriate because the pre-service teachers could place themselves in-between the two avatar students to address the behavior and also block the avatar student’s access to each other.

The results of this study lend partial support to, and further extend, Reupert and Woodcock’s (2010) findings that that pre-service teachers tend to be more confident in using early corrective strategies such as proximity and less confident using later corrective strategies such as manipulating the rewards system or referring the student to another professional such as the principal. Similar to these findings, the researchers found that the pre-service teachers were more likely to use proximity and retreatism when controlling non-compliant and calling out behaviors. Pre-service teacher were more likely to use proximity for inappropriate peer-to-peer interactions. No significant results emerged for pre-service teachers’ use of normative or coercive strategies. Furthermore, the researchers found that only one pre-service teacher used the remunerative strategy when handling avatar student misbehavior.
This study further extended the existing research by examining which strategies pre-service teachers were most likely to use in response to certain student misbehaviors. Previous studies had not examined which strategies pre-service teachers were likely to use based only on the type of misbehavior the student was engaged in. Additionally, this study extended the current literature by observing pre-service teachers interactions with avatar students rather than relying on hypothetical vignettes or teacher self-reports.

**Limitations**

There were many limitations to this study largely due to the virtual environment in which it was conducted. When observing sessions it became apparent that the avatars each had a limited behavioral repertoire based on the personality of their character. Avatars engaged in the same types of behaviors during each session. As a result, for many behaviors, only one gender exhibited the misbehavior or exhibited the behavior at a more extreme level. There were only two behaviors that could be examined for gender differences due to the disproportionate engagement in misbehaviors. Therefore there was a very limited range of misbehaviors that were able to be compared.

Additionally, pre-service teachers were aware that they were being recorded and often a course instructor was in the room watching the sessions and giving feedback and the end of the session. This may have affected the pre-service teachers’ actions making them more likely to react in a socially appropriate way.

Another challenge of this study was operationally defining misbehaviors. For example, a student may call out to another peer and disrupt the entire class. In situations such as this it was difficult to determine whether the student’s misbehavior should be coded as “calling out” or “inappropriate peer-to-peer interaction”. This became a challenge for the researcher herself when coding the videos as well as in communicating with the second coder about how to categorize certain actions. Future researchers should be very specific in their operational definitions of misbehaviors.

Finally, the findings of this study are further complicated by the gender of the actor who controlled the actions of the avatar students as well as the actor’s own biases that may have affected how the avatar student’s personality was portrayed. Though the actor was portraying both male and female students, she was female herself and may not have accurately or
convincingly played the role of a young male student. Future researchers may want to consider the possibility of having actors of both genders portray the avatar students.

**Implications for Practice**

The results of this study indicate that pre-service teachers may not be comfortable using a remunerative strategy when controlling student behavior. Despite the growing use of positive behavioral supports in schools, only one participant in this study referred to a reward system when attempting to manage an avatar student’s misbehavior. This finding indicates that pre-service teachers may need more training and practice in using reward systems to influence and control student behavior.

Additionally, pre-service teachers were more likely to ignore non-compliance and calling out. This may have been a purposeful strategy used by the pre-service teachers; however, another explanation is that pre-service teachers may not have known how to handle these misbehaviors and chose to ignore them instead. If the latter explanation is true, pre-service teachers may need better instruction and more opportunities to practice addressing serious student misbehaviors, or misbehaviors that are likely to escalate.

**Implications for Future Research**

Despite some of the limitations, several implications for future research using the TeachLivE technology emerged. Though we did not have permission to make changes to the avatars for this study, the technology exists to change the skin color and gender of the avatar students. Future researchers could conduct similar studies where they could systematically change the race and gender of the avatar students and eliminate the problem of having students of one race or gender engaging in the same misbehaviors for every session. Thus, future studies may be able to examine more types of behaviors. Additionally, the lab could be used with participants who were not part of a class or being observed by a course instructor. Though participants would still know they are being observed, they may be more likely to act naturally than participants who are being observed by a course instructor.

Future researchers may also wish to further examine the relationship between certain student misbehaviors and pre-service teachers’ responses. Future research may also expand the current literature by examining more experienced, practicing teachers’ choice of classroom management strategies in relation to the type of student misbehavior. Further research should
also examine the effectiveness of these strategies in managing different types of student misbehavior.

Overall, the TeachLivE lab has practical implications for allowing pre-service teachers the opportunity to practice classroom management techniques. Future research should examine how the lab can be used to answer questions related to gender differences and teacher’s responses to different types of student misbehavior.
References


## Appendix A

<table>
<thead>
<tr>
<th>1. Student Behavior</th>
<th>Non-Compliance</th>
<th>Calling Out/Talking Out of Turn</th>
<th>Off-task Commentary</th>
<th>Inappropriate Peer-to-Peer Conversation/Interaction</th>
<th>Off-task Motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Student Demographics</td>
<td>Race</td>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Teacher Response</td>
<td>Use of Proximity</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Tone of Voice</td>
<td>Negative-Neutral-Positive</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>3.2 Management Style</td>
<td>Teacher Normative</td>
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<tr>
<td></td>
<td>Teacher Remunerative</td>
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<td>Teacher Coercion</td>
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<td></td>
<td>Teacher Retreatism</td>
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<td>4. Duration of Incident from Onset to Resolution</td>
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<td>Notes:</td>
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Appendix B

Dear participant:

My name is Amity Noltemeyer and I am an Assistant Professor in School Psychology at Miami University.

You are invited to participate in a research study of pre-service teachers’ reactions to classroom behaviors. As part of your class requirements for XXX you will be participating in TeachLIVE lab sessions over the course of the semester to practice classroom management techniques, and having these sessions videotaped. Each session lasts approximately 5-10 minutes. As part of this study I am requesting access to these videotapes so that myself and two graduate assistants can code behaviors and management techniques. If you provide permission, these videos will be given to me by the course instructor (you do not need to provide them) and will be seen by myself and the two graduate students. Your data will not be linked with your name and will be stored in a locked file cabinet for one year. Your participation is completely voluntary and you may withdraw at any time without affecting your grade in the course. You will not be asked to do anything that exposes you to risks beyond those of everyday life. The benefit of the study, scientifically, is it will help us understand how teachers react and respond to students’ behavior in the classroom setting.

If you have further questions about your rights as a research participant, please call the Office of Advancement of Research and Scholarship at 529-3600 or email: humansubjects@muohio.edu. If you have further questions or would like to learn more about the study, please contact me at anoltemeyer@muohio.edu, or my graduate assistant, Jillian Black, at blackj3@muohio.edu.

Thank you for your participation. We are grateful for your help. Please keep the top half of this page.

Amity Noltemeyer, Ph.D., NCSP
Assistant Professor in School Psychology
Department of Educational Psychology
Miami University
513-529-6632 (Office)

I agree to participate in the study of pre-service teachers’ reactions to classroom behaviors, and I give informed consent for the videotaped sessions to be released to the researcher. I understand my participation is voluntary and that any information collected will be kept confidential. By signing below, I acknowledge that I am 18 years or older.

Participant’s name ____________________________________________________________

Participant’s signature ___________________________________________ Date:__________